DOCUMENT RESUME

ED 344 363 EC 301 089

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TITLE The University of Tulsa School for Gifted Children Enaction Curriculum, 1991-92.
INSTITUTION Tulsa Univ., OK. School for Gifted Children.
PUB DATE 91
NOTE 34p.
PUB TYPE Reports - Descriptive (141) -- Guides - Non-Classroom Use (055)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Academically Gifted; Arithmetic; Art Education; Cognitive Processes; Computer Literacy; *Curriculum; Educational Methods; Elementary Education; French; Geography; History; Language Arts; Literature; Mathematics; Models; Music Education; Preschool Education; Problem Solving; Sciences; Social Studies; Spanish; *Special Schools; *Thinking Skills
IDENTIFIERS *Enaction Theory; *University of Tulsa School for Gifted Children OK

ABSTRACT

This document summarizes the curriculum at the University of Tulsa School for Gifted Children in Oklahoma. The curriculum is based on enaction theory which postulates that thinking is a matter of running a simulation in one's head and involves three steps: (1) creating a mental model; (2) manipulating that model; and (3) developing a strategy for problem solving. Other curriculum emphases include thematic content, utilizing the university connection, teachers as learners, and the importance of values. After an introduction, the curricula in language arts, math, science, social studies, and special subjects are briefly described for the levels of Early Childhood, Primary I, Primary II, Primary III, and Intermediate I. More detailed descriptions are given for Older Intermediates in the subject areas of math, language arts and enrichment, physical education, geography and great books, and history. The next section describes special subjects taught across many levels including computer, Spanish and French, general music, art and drama, Kumon (a method of teaching computational skills) developing multiple talents, intermediate science, and library/resource room skills. A scope and sequence chart concludes the curriculum description. The document ends with an article reprint, "Enaction Theory: A Theoretical Validation of the Enrichment Triad Model" by Patricia L. Hollingsworth. (Five references) (DB)

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THE UNIVERSITY SCHOOL ENACTION CURRICULUM

Edited by Patricia L. Hollingsworth, Ed. D.

1991-92

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THE UNIVERSITY SCHOOL
ENACTION CURRICULUM

The University School Enaction Curriculum is designed to meet the special needs of able learners by developing their capacities for thinking and problem solving and providing stimulating and challenging knowledge. The Enaction Curriculum is a curriculum based on Ohlsson's Theory and Glaser's position on domain specific knowledge. Enaction theory postulates that thinking is a matter of running a simulation in one's head. The three steps involved are creating a mental model, manipulating that model, and developing a strategy for problem solving.

PROGRAM GOALS

Our goals are to 1) enhance academic achievement, 2) provide an emotionally supportive, yet intellectually challenging, atmosphere, and 3) develop a creative and positive approach to school and learning.

Enaction Theory

The first step in the Enaction Curriculum is developing the mental model or schema of an object system. In this step, activities are focused on ways to develop the mental model more fully, such as drawing, creating simulations, building models, participating in concept attainment, and reading. The next step involves all the things that could be done to a model. Here activities involve experimenting and manipulating models. The third step focuses on what has been learned that would be useful in future problem solving. Step three involves individual and group evaluation of what was learned, how it was learned, and what might be done to make learning more effective.

The Importance of Content

Coupled with the process-oriented Enaction Theory is an emphasis on thematic content. This content emphasis was selected because research has found that thinking is strongly influenced by experience with new information. It has been found that expert problem solvers are those with conceptual and procedural knowledge in a specific content area. Problem solving, comprehension, and learning are based on knowledge. There can be no problem solving, evaluation or thinking without subject matter, content, or knowledge. Productive thinking, planning, decision making, communication, and forecasting are taught at University School through content areas using the Talents Unlimited model. In addition, students are encouraged to pursue their academic interests with indepth independent study and research projects following the Renzulli Triad model.

The University Connection

Another essential component of the curriculum involves making use of our relationship with the University of Tulsa. The University Connection consists of T.U. Exploration, in which children visit classes, professors, staff, students, and exhibits, and T. U. Input, in which those resources come to us. Our relationship with the University provides us with numerous unique resources that few schools can match.

Other Curriculum Strategies

The Enaction Curriculum, while providing structure and direction for our curriculum, is flexible enough to encompass a variety of other research based approaches with national and international recognition. Math and reading strategies that research has shown to be effective are used. We use Renzulli's Triad Enrichment approach to children's independent investigations and Talents Unlimited to develop student's multiple talents. The Developing Capable Young People approach and classroom meetings are used to teach children to solve their own problems and develop responsibility. We use the hands-on approach of Math Their Way and Mathematics a Way

of Thinking to augment Kumon math. The organic, whole language approach to reading and writing, which we developed and use is called "Word Work." Our unique curriculum system is open to using approaches that have proven to be effective.

Teachers as Learners

The teachers at University School are involved in on-going learning experiences for personal and professional growth. They attend and participate in professional conferences, workshops, university courses, and in-service staff development. The love of learning is an important attitude that is conveyed by the entire staff.

Curriculum Change, Growth and Revision

The description of curriculum which follows is our most current format; however, all programs are subject to change without prior notice. As we continue to learn, we continue to grow and change. Our curriculum is not static, but dynamic and responsive. The curriculum at University School is constantly being revised to better meet the needs of the students we serve. All of education is an experiment.

Values

While the specifics of our curriculum change, our values do not.

- We want our students to love learning, to love life, and to respect and care for all living things.
- We want our students to value the gifts given them and to share those gifts responsibly with the world.
- For these things to happen, we as teachers and parents must teach and model these values.

Our goal is for teachers, staff, parents and students to strive toward making these values work in our lives.

Important Rules

Written Withdrawal Notification, An Essential

When parents decide to permanently remove children from University School, it is absolutely essential that notification be given in writing. Tuition billing continues until the school receives notification in writing. You will be held responsible for all tuition that is billed to you. This is part of your written contract.

Appropriate Behavior

It is a privilege to be a student at University School. This privilege is for students who can benefit from the experience and who are able to maintain appropriate behavior. Violent behavior, of any kind, is not tolerated. Kicking and hitting of other students is strictly forbidden.

Fines

Students are to be at school only during school hours. Parents of students who are brought too early or left too late will billed appropriately.

School Hours:

Early Childhood through Primary III - 9:00 to 2:30

Intermediate I through Older Intermediates - 8:45 to 2:45

Students may begin arriving 10 or 15 minutes prior to class but will generally stay outdoors until class begins so that teachers may prepare for the school day.

UNIVERSITY SCHOOL

EARLY CHILDHOOD

Teachers:

Debi Foster
University of Oklahoma, B.F.A.,
Art Education
Math Their Way Workshop
Math Their Way Follow-up

Alicia Parent
University of Oklahoma, B.S.,
Early Childhood Education
Math Their Way Workshop
Math Their Way Follow-up
Whole Language Conference, St. Louis

Aide: **Karen Warner**
University of Tulsa, B.S., Education

The Early Childhood curriculum has been developed as a 2 year cycle so that children cover different material each year. While the Early Childhood curriculum seeks to challenge children intellectually, there is no pressure or push into the academic areas. Teachers are sensitive to the individual development of young children and know appropriate learning experiences for them. The goal of the program is to maximize the social, emotional, physical, and intellectual development of the children. Children are encouraged to be active, independent, and creative learners while also learning to be responsible and cooperative.

LANGUAGE ARTS

Children are encouraged to express and develop their ideas orally during group time through the use of the Talents. Children develop a high level of proficiency in Productive Thinking and Decision Making, which fosters creative and problem solving abilities.

Children are introduced to upper and lower case letters and to their sounds. This is done through the use of Sound Books. As children become developmentally ready, they begin the organic, whole language method of reading and writing called "Word Work," which is used throughout the school. Children receive words of their choice, which form the content of reading and writing. This method provides individualized reading and writing material for each child. Children also dictate stories for teachers to write for them.

MATH

Children begin use of Math Their Way materials with free exploration, sorting, and patterning. Children are also introduced to estimation, the number line, graphing, calendar work, recognizing numerals, one-to-one correspondence, and numbers at the concept level. The Math Their Way approach is in keeping with the Enaction Curriculum in that it provides active, hands-on, learning experiences.

SOCIAL STUDIES AND SCIENCE

The theme for Early Childhood is "Investigating Our World." Units include Becoming Responsible, Working Together, Indians, Textures, Animals, Our Bodies, Magnets, Seasons, Nature and Environment, Opposites, Colors, and Solids and Liquids. Students are encouraged to observe, describe, compare, and classify.

INDEPENDENT AND REQUIRED WORK

Each week children have a list of required work, called "Must Do Work," that they are to complete. Children choose when they will complete the work, but it must be done by the end of the week. Additionally, there is ample time for selection of independent work, which includes a wide variety of arts and crafts, sand and watertable materials, block building, other manipulatives, games, and books. Children develop a responsible approach to work in that they learn to carry out some teacher-directed activities, but also remain self-directed when appropriate.

SPECIAL SUBJECTS

Children also take computer, music, art, and Spanish. For a description of those courses, refer to the SPECIAL SUBJECTS section following the CLASS LEVEL section.

UNIVERSITY SCHOOL

PRIMARY I

Teachers:

Patricia Hollingsworth
Florida State University, B.S., Education
University of Tulsa, M.T.A., Art Ed.
University of Tulsa, Ed. D., Ed. Admin

Graduate Work:
George Washington University
University of Florida
University of Oregon
SOI Institute Workshops, Advanced Trainer
Post-Graduate Work with Renzulli,
University of Connecticut
Gifted Education Endorsement, Oklahoma and Florida

Keith Anne Brant
Oklahoma City University, B.A.
Early Childhood Education
Certified Montessori Teacher

Lucille Kelly
Former YWCA Educational Administrator

LANGUAGE ARTS

The Phonetic Approach

The content of the Primary I curriculum is thematically focused on the Letter Sound of the Week. Each week a specific letter sound is selected for study. Children learn to distinguish between letter-name and letter-sounds. Children learn vocabulary words that begin with the letter-sound, science and social studies topics that begin with the letter-sound, and learn to write the letter. During the first semester, the easiest and most common consonants plus the short vowels are studied. During the second semester, the less common consonants, blend sounds, and long vowels are studied. Each day students are individually evaluated to discern the level of phonetic attainment.

Organic, Whole Language Reading and Writing: Word Work

Primary I builds on the skills developed in Early Childhood in organic reading and writing. Students begin the school year by getting a new word each day of their own choosing. These words form the basis of the writing and reading done in class each day. When the student is both reading and writing the words with ease, sentence writing is introduced. By the end of the year, students are writing stories each day using their own personal dictionaries. The important thing about this method of reading and writing is that the content is meaningful and motivating because it comes directly from the children and their experiences. The handwriting method is D'Nealian, which is used throughout the school.

MATH

Math Their Way is a concrete, hands-on method of teaching number skills. The method provides a variety of three-dimensional materials that are used to teach counting, addition, and subtraction. Children are assessed to determine their entry level and then periodically assessed throughout the year. A wide variety of other math manipulatives, such as geoboards, patterning materials, centimeter cubes, and math games are also available in the math area. Children begin using some of the hands-on Kumon materials also.

SCIENCE

The Primary I Science Curriculum is based on the modified spiral pattern used throughout the school. The theme is "Exploring Life Chains." Topics to be introduced are: Insects, Birds, Reptiles, Amphibians, Mammals, Botany, and Actions and Reactions of Water and Air. Students are encouraged to become actively involved in collecting information, experimenting, and drawing conclusions. The Talents, such as Productive Thinking, Communications, and Forecasting are often used in science.

SOCIAL STUDIES

The Primary I Social Studies theme is "Ourselves and Others," which involves comparing our lives with those of others, both past and present.

History

Students are introduced to a variety of historical figures, the majority of which are related to holidays that we celebrate. The lessons begin with stories, films, songs, and pictures about the event and move to the children themselves reenacting the historical event. Often these dramas are produced for parents and other students, but some are performed just for the class itself. People or events that are introduced are Columbus, the Pilgrims, George Washington, Martin Luther King, Abraham Lincoln, Queen Victoria, Queen Elizabeth I, King Henry VIII, and the Oklahoma Land Run.

Geography

The people and events studied are a natural lead into the study of other countries. Students begin by learning the location of Spain and Italy during the study of Columbus. By the end of the school year most of the students can locate all of the continents. Young children have a great curiosity about our world and enjoy learning about maps and globes. The following are included in our studies: Italy, Spain, Japan, China, Ireland, Asia, United States, Oklahoma, and Egypt.

Cooking

A variety of cooking activities are planned and implemented by the students. Students learn to use the Planning Talent prior to the cooking event so that all goes smoothly. With teacher help students have made soup, pretzels, granola, jello letters, and a number of other dishes.

WORK AREAS

Each morning students work with a teacher in the Math Area, the Language Arts Area, and a combined Science and Social Studies Area. When students are not working directly with a teacher they are free to make choices of work in the Independent Work Area. The Independent Work Area is comprised of the Dramatic Play Area, the art easel, the science table, plus a variety of art materials and manipulatives.

SPECIAL SUBJECTS

Students also take computer, music, art, Spanish, and participate in Talent development. For a description of those courses refer to the section called SPECIAL SUBJECTS following the CLASS LEVEL descriptions.

UNIVERSITY SCHOOL

PRIMARY II

Teacher:
Amy Rutter
Baylor University, Waco, TX
B.S., Education
Whole Language training
Kumon training

Assistant Teacher:
Megan Handy
University of Louisville, junior

The curriculum in Primary II builds upon the basic skills and foundations initiated in Early Childhood and Primary I. Reading, writing, social studies, and science are taught on a group or individualized basis depending on which is the most effective learning experience.

LANGUAGE ARTS

Oral reading in small groups occurs daily. Reading is taught in a variety of ways in order to meet the children's individual needs. Mastering good comprehension skills is an important part of the reading program. D'Nealian handwriting skills, punctuation, and parts of speech, are slowly introduced and improved upon during the year through "Word Work", a whole language approach to writing and reading. Primary II students continue writing stories each day with the use of their own personal dictionaries. Students work on editing and revising their written stories with the use of skills learned throughout the year. Silent reading is always encouraged.

MATH

Math in Primary II incorporates Kumon math (see Special Subjects), Math Their Way and the McGraw Hill math Series. Students build upon and extend their skills in addition and subtraction. They learn to add and subtract two and three digit numbers with regrouping. The basics of geometry, measurement, fractions, money, and time will be taught. A variety of math manipulatives are used to make the learning of concepts meaningful.

SCIENCE

The Primary II science theme is "Investigating Changes Around Us." Topics included are: Rocks and Fossils, The Solar System, Magnetism and Electricity, Behavior or Matter: Liquids, Solids & Gases, and Soil and Plant Growth. The purpose of Primary II science is to develop inquiry skills needed for scientific investigation.

SOCIAL STUDIES

"Living Together at Home and at School" is the Primary II Social Studies theme. Units include: Rules and Manners, Safety, and Community Roles. Important historical events are discussed as they arise.

INDIVIDUAL PROJECTS

During the second semester each student chooses a topic to research. Using the "Talents", students plan a project. Each research project has a written report and product (model, chart, painting, etc...).

SPECIAL SUBJECTS

Students also take music, Spanish, computer, art, and work with the Talents. Please refer to the SPECIAL SUBJECTS section for a description.

UNIVERSITY SCHOOL

PRIMARY III

Teacher:

Julie Sisler
Oklahoma State University, B.A.,
in Elementary Education
University of Tulsa, M.T.A., Biology and
Gifted Ed. Endorsement in progress
Selected for Summer Biology Workshop, U.T.
Whole Language Conference, St. Louis
Selected for National Science Foundation
graduate work, Tulsa
Kumon training
Great Books training
Wilderness Leadership School, Jackson Hole, WY
Project Wild training, Stillwater

Assistant Teacher:

Christine Bewley
University of Tulsa, B.S., Social Studies
University of Tulsa, graduate work, Gifted Ed.

LANGUAGE ARTS

The organic, whole language approach called "Word Work" is used, connecting reading and writing with all areas of learning. Students write in their individual journals daily. Upon completion of a story, editing and publishing follow, allowing students to use grammar, punctuation, and handwriting skills learned in class. Students develop personal dictionaries from their own creative and individualized writing. Most spelling words are derived from students own misspelled written work but others come from vocabulary associated with current units of study. D'Nealian handwriting skills are continued and reinforced. Children read aloud daily in small groups. Reading materials include a variety of literature (prose and poetry) designed to accommodate a range of abilities and interests. Additionally, the teacher reads aloud to the students each day.

MATH

Concepts and foundations are developed through Kumon (see Special Subjects), Math Their Way, Miguon and the Addison-Wesley Mathematics series. Students extend their learning in such areas as graphing, multiplication and division facts, fractions, estimation, measurement, geometry, patterning, money, time, story problems and simple algebraic equations.

SCIENCE

In class, Primary III focuses on the theme "The Mysteries of Science", encompassing the areas of ecology, meteorology, ornithology, oceanography, and human physiology. An extensive science-related vocabulary is introduced and students are encouraged to be actively involved in hands-on science investigations.

Students also have science with Mrs. Block. During those classes, as in all the Science classes, Primary III makes continual use of the Talents. For example, the class uses the Productive Thinking Talent and the Decision Making Talent in deciding many, varied, and unusual ways to moisten plants. Then students use the Forecasting Talent to predict the outcome of using particular moistening agents. Students use the Planning Talent and the Communication Talents in observing and recording the Process.

Hands-on activities are an integral part of the class. Some of the natural phenomenon which students will observe, predict, and record are:

- heat rising
- influence of temperature on air
- states of matter: liquid, solid, and gases

The goals of Primary III Science are that students enjoy science and become careful observers.

SOCIAL STUDIES

Primary III learns about The United States and other countries of the world by traveling on a "trip", complete with passports and luggage. While visiting the countries, students gain knowledge of a variety of cultures. Geography, economics and mapping skills are also applied. Students learn to write reports related to countries visited. Vocabulary and spelling words are introduced from our travels.

SPECIAL SUBJECTS

Students also take Spanish, computer, music, art, and develop multiple Talents. Please refer to the SPECIAL SUBJECTS section for a description.

UNIVERSITY SCHOOL

INTERMEDIATE I

Teacher:

Kim Harper
Oklahoma State University, B.S., Lang. Art
Teacher Observation Seminar, Colombia, S.A.
Kumon Training
Shurley English Grammar Training

Assistant Teacher:

Christine Bewley
University of Tulsa, B.S., Social Studies

LANGUAGE ARTS

Reading

The reading program uses children's literature, primarily Newberry Award and Honor Books, General literature and poetry to provide varied subjects, levels, and types of reading. Activities build on previously acquired skills in phonetic analysis, comprehension development, and higher level thinking skills. Skills needed for reading in the content areas are emphasized.

Spelling

The spelling program provides a systematic approach to sound-spelling relationships based on patterns or structure of words. Group instruction is used to introduce spelling patterns and structure; however, students will have individual spelling lists. Vocabulary building is an important part of spelling and is emphasized in Intermediate I.

Writing

The continuation of the organic, whole language method of reading and writing, "Word Work," provides reinforcement of grammar and punctuation skills on an individual basis. Both oral and written reports provide extended practice for correct language usage. Students continue to master D'Nealian manuscript and begin D'Nealian cursive as they demonstrate readiness. Weekly Writers' Conferences continue to help students learn to clarify and revise their written work. Poetry is another important aspect of writing in this class

MATH

Math Their Way, Mathematics a Way of Thinking, and the Addison-Wesley Mathematics series form the basis of the Intermediate I Math Curriculum. Students work on maintaining and developing computation skills in addition, subtraction, multiplication, and division. Work on time, estimation, measurement, money, geometry, and graphing continue. Students are introduced to decimals and simple probability.

SOCIAL STUDIES

The social studies theme, "The Interdependence of Communities and Regions of the World," looks at how land forms influence climate, economics, and culture. Students are introduced to the history, geography, and culture of the seven continents, including states and Presidents of the United States. The aim of this course is for students to begin to understand global interdependence.

SPECIAL SUBJECTS

Students also take art, music, computer, Spanish, science, Kumon and learn to use the Talents. Please refer to the SPECIAL SUBJECTS section for a description.

UNIVERSITY SCHOOL

OLDER INTERMEDIATES: Math

Teacher:

Marilyn Howard
University of Tulsa, B.S., Mathematics
Indiana University, M.A., Mathematics
Programmer/Analyst, Boeing Computer Services
and University of Texas, Permian Basin, 1972-1982
Selected for the University of Tulsa Summer Institute
for the study of Statistics and Probability, 1989
Kumon Training, Houston, TX, and Tulsa, 1990

MATH

Basic math concepts and facts are introduced and reinforced through the self-paced Japanese method of instruction known as Kumon. Please refer to the SPECIAL SUBJECTS section for a more complete description. Math class is largely devoted to problem solving strategies, geometry, probability and statistics, and other topics that are not covered in detail in Kumon.

A concrete, "hands-on" approach is used for introducing most new topics from 4th grade math through pre-algebra. Manipulatives such as pattern blocks, unifix cubes, pentominoes, cuisenaire rods, tangrams, dice, cards, and calculators help to enrich our math program.

Several Texts are used for 4th through 8th grade classes, including:

Addison Wesley Mathematics by Robert Eicholz, Pharis G O'Doffer, and Charles R. Fleenor, Menlo Park, California, 1987

HBJ Mathematics by Lola J. May, Shirley M. Frye, and Donna Cyrier Jacobs, New York, New York, 1981

Heath Algebra I by Clyde A. Dilley, Steven P. Meiring, John E. Farr, and Ross Taylor, Lexington, Massachusetts, 1987

UNIVERSITY SCHOOL

OLDER INTERMEDIATES: Language Arts and Enrichment

Teachers:

Julie Nierenberg
Earlham College, B.A., Biology
University of Tulsa, M.A. in Gifted Ed.
in progress
Whole Language Training, St. Louis, 1990

Katie Abercrombie
University of Oklahoma, M.B.A.
University of Oklahoma, B.S., Journalism
Tulsa Tribune, Reporter
Tulsa Jr. College, Writing Instructor
Shurley English Grammar Training

LANGUAGE ARTS

Creative Writing - Writing Workshop

The student's creative expressions in poetry and prose are used as a basis for individualized teaching of spelling, editing, handwriting, and vocabulary. Students work with a partner drafting revisions and improvements until a final copy is submitted. Daily lessons model the necessary composition and writing mechanics skills for development of independent writing abilities. Penmanship needs are assessed from cursive drafts of writing submitted.

When the final copy of the student's work is bound into book form, they are encouraged to share their works with classmates as well as younger classes. This sharing provides reinforcement of oral reading skills and leads to the development of a positive self-concept. Students will systematically submit their writing to children's publications to gain experience in seeking a wider audience. Student-authored books (of appropriate content) are added to our permanent library collection. We also make coloring books from students' stories.

Reading - Response Writing

The core material consists of outstanding works of children's literature. Basic reading, decoding, and analytical thinking skills are taught and reinforced through silent and oral reading, followed by a written response to the day's reading portion. A reading/writing partner responds to his/her partner's writing, and in this way a dialogue is developed about the story content.

At the conclusion of each book, evaluative comparison exercises are given (book reports and reviews, essay questions, dramatic portrayal, and other ways of conveying content comprehension).

Journal Writing

Journal entries are read by the teacher and are responded to with written remarks to inspire and develop depth and clarity in the expression of written thoughts. Students are encouraged to write about their daily lives, their plans, their likes and dislikes, their aspirations, adventures, and struggles. Journal entries may provide rich sources for creative writing themes, but the journals themselves are not corrected or graded.

Newspaper - Magazine

Students submit stories, poems, articles, comics, and special interest features for publication in our classroom newspaper or magazine. They will learn interviewing, reporting, editing, meeting deadlines, writing editorial opinions, and equitable methods of selecting entries for our classroom publications. Student "jobs" are rotated, and positions of responsibility are earned through consistent effort and performance in class.

Enrichment Class for Older Intermediates

Individual and group activities include three types of enrichment:

Type I. Exposure to a wide variety of informational resources allows students to explore and assess their interests. Printed matter, guest speakers, visual presentations and field trips are utilized to introduce new concepts.

Type II. Skill development to enable independent learning is tailored to the interests and abilities of each student. Students learn to locate, interpret, and classify information and to use a personal filing system.

Type III. Research, conducted individually and in small groups, culminates in multimedia products for presentation to an audience. The pace, scope, and product requirements are tailored to the research project. Written reports are required from all students.

GRAMMAR AND WRITING SKILLS

Designated class time each week is set aside for small group lessons. The patterns, formation rules, and categories of English words and sentences are systematically taught with the Shurley English System as a basic unit of structure. Appropriate reinforcement exercises are given for each grade level. Remedial needs are targeted for further individualized instruction.
Whenever possible, grammar and other skill reinforcement is connected and applied to students won writing. Students analyze and correct their individual writing patterns. Participation in and mastery of drills are encouraged by rotating student Shurley "teachers".

OLDER INTERMEDIATES: Physical Education

Teachers:

Marina Coulter
USRJ (University at Rio de Janeiro), Medical Degree

Barbara Holleman
Oklahoma School of Business
Physical Education Training

PHYSICAL EDUCATION

The course endeavors to improve both individual skill levels in basic movements (The Presidential Fitness Events) and teamwork (volley ball, basketball, softball, etc.). Physical education classes offer an excellent opportunity to develop social skills, leadership, and conflict resolution. The major objectives of the course are to provide the student with the experience of the enjoyment of developing his or her physical potential, to develop specific skill competencies, and to enable the student to function well in a group situation.

UNIVERSITY SCHOOL

OLDER INTERMEDIATES: Geography and Great Books

Teacher:

Colin Spruce
University of London, BSEE
University of Tulsa, M. Eng. Mgmt.

GEOGRAPHY

Geographic Skills are introduced and further developed through group and individualized reading assignments, discussions, lectures, and culturally-based independent, or small group, research projects. Emphasis is upon the development of students' research skills, deductive reasoning, and teamwork. Teamwork develops students' interactive skills in obtaining an identified goal. The content areas covered are: physical, economic, cultural, and social geography. When appropriate, current events are also introduced. Historical events, as they apply to the development of geographic principles and discovery, are also woven into the learning cycle.

Materials used:

Modern Physical Geography, John Wiley and Sons
The Earth, Ginn and Co.
Physical Geology, Prentice Hall
A World View, Silver Burdett and Ginn

GREAT BOOKS

The Junior Great Books Program is a twelve week program in which students read one selection at home and come to class prepared for discussion. Students are grouped for discussion by age and read the book of selections published by the Great Books Foundation that most closely corresponds to their age. A short course in conflict negotiation is also presented in this class.

Junior Great Books differs from other programs and methods in its approach to reading because it teaches students to formulate and ask questions as well as to answer them. They learn to read interpretively and to think reflectively. During the discussions they are encouraged to try out explanations of the meaning of a piece. Students are also encouraged to discuss what genuinely puzzles them in what they read. Participation in this program cultivates the skills of reading, speaking, and listening.

UNIVERSITY SCHOOL

OLDER INTERMEDIATES: History

Teacher:

Olivia Marino
University of Tulsa, B.F.A., Art
University of Tulsa, M.A., Painting
Philbrook Museum of Art, Adjunct Lecturer
Tulsa Junior College, Adjunct Faculty, Humanities

HISTORY

Students continue to develop their knowledge and understanding of America as an independent nation and as a member of the world community of nations.

The objectives of the history studies program are to develop critical thought and the spirit of inquiry. Our students begin to define the meaning of America as they enhance their fundamental knowledge of significant persons, events, and ideologies shaping this nation. Students develop an increased awareness of and familiarity with the varying methods historians use to explore research questions.

Students learn through common and individualized reading assignments, discussions, lectures, and culturally based independent or small group research efforts that result in in-depth reports or term papers. Maps are used on a regular basis to enhance the spatial awareness of historical places and events. Students learn to adapt the over-all historical scope to their personal interests by frequent consideration of personal, family, and local studies in relation to both American and world history.

Materials used:

Our History, Holt, Rinehart, and Winston.

Scholastic News

Value Tales series: biographies from Value Communications, Inc.

Scholastic series: Success With Maps

Selected reading, primary source materials, documents, historical interpretations

SPECIAL SUBJECTS

Older Intermediate students also take music, art, computer, science, Spanish, and talent development. Please refer to SPECIAL SUBJECTS section for descriptions.

UNIVERSITY SCHOOL

SPECIAL SUBJECTS: Computers

Teachers:

Marilyn Howard
University of Tulsa, B.S., Mathematics
Indiana University, M.A. , Mathematics
Programmer/Analyst , IU, Boeing Computer Services and Univ. of Texas, Permian Basin, 1972-1982
Mathematics: A Way of Thinking Workshop
Selected for University of Tulsa Summer Institute for the Study of Statistics and Probability, 1989
Kumon Training, Houston, TX, and Tulsa, 1990

Colin Spruce
University of London, BSEE
University of Tulsa, M. Eng. Mgmt

Hardware:

12 IBM PcJrs., 2 Apple II GS, 2 Apple IIe, 1 Macintosh Plus, and 1 Macintosh SE with a 20 meg harddisk, AT Clone with a 20 meg harddisk and internal modem for data logging, 2 ImageWriter II printers.

EARLY CHILDHOOD and PRIMARY I COMPUTER

The goal for children at this level is a positive learning experience with the computer. A variety of educational programs helps familiarize the students with the keyboard, and develop math and reading readiness skills.

The instant version of LOGO, a list processing language, is introduced. A triangular shape called the turtle is used to draw pictures using the following commands:

C	CLEARSCREEN
F	FORWARD 10
B	BACK 10
R	RIGHT 90
L	LEFT 90
H	HIDE TURTLE
S	SHOW TURTLE

PRIMARY II AND PRIMARY III COMPUTER

At this level, the children recognize the computer needs instruction. They can follow a procedure for a familiar task, and can modify a procedure or find and correct errors in a procedure. Basic computer vocabulary and computer applications are introduced. Students begin to learn the full LOGO commands such as:

FORWARD 10
RIGHT 90
CLEARSCREEN
etc.

They use LOGO to write simple procedures.

INTERMEDIATE COMPUTER

Students practice correct keyboarding techniques and learn to use the following tools:

- Word Processor
- Database Manager
- Graphing Assistant
- Spreadsheet

They build on what they have learned in LOGO, developing procedures involving repetition, decision making, and variables.

The students learn to program in BASIC utilizing FOR-NEXT loops, IF-THEN statements and variables. Using what they have learned, the students modify existing programs and write their own programs.

In addition, they begin to learn about the internal workings of the computer. Students learn the binary number system and build databases for class use.

The students use a variety of educational software including:

- Drill and practice programs
- Simulations
- Computer Aided Instruction (CAI)
- Problem solving programs
- Adventure games

UNIVERSITY SCHOOL

SPECIAL SUBJECTS: Spanish and French

Teacher:

Linda Stoesser
State University of New York at Buffalo, M. Ed., Foreign Languages
Ohio Wesleyan University, B.A., Spanish

EARLY CHILDHOOD AND PRIMARY I SPANISH

During the school year children build a basic vocabulary in Spanish by learning greetings, animals, foods, numbers, colors, and the Spanish alphabet. Games, rhymes, and songs are introduced to reinforce prior learning and to make Spanish interesting and enjoyable. It is important for children to be introduced to a foreign language at a young age. Young children acquire a second language with fewer of the diction and pronunciation problems of older learners.

PRIMARY II AND PRIMARY III SPANISH

The students build on previously learned vocabulary by orally answering and asking questions in complete sentences in Spanish. They participate in spontaneous and memorized Spanish dialogues. Students play games, learn rhymes, and sing songs in Spanish, as well as, learn a variety of aspects about Spanish and Hispanic culture. The children attend the University of Tulsa Foreign Language Lab to listen to songs, rhymes, vocabulary words, and dialogues in Spanish. The goal for the children at this level is extensive development of listening and speaking skills in Spanish. The text used is Hablan los Ninos by Dorothy Sword Bishop.

INTERMEDIATE I SPANISH

Building on the vocabulary previously acquired in Spanish, the students use the textbook, Let's Speak Spanish, to improve listening and speaking skills. The first book has no words, only pictures, which helps the students associate the sound of the language with its meaning. Pronunciation, vocabulary structure, and conversational skills are introduced. Quizzes are given at the end of each lesson to assess comprehension. A variety of cultural aspects of Spanish-speaking peoples, such as history, arts, songs, rhymes, and games are studied. Students attend the University of Tulsa Foreign Language Lab once a month.

INTERMEDIATE II SPANISH

The students use the textbook, Ya Se Leer, to learn to read in Spanish. A workbook that accompanies the text is used to reinforce and develop grammar skills. Quizzes are given after each lesson to assess comprehension. Classwork involves dramatizing dialogues, learning rhymes, songs and poems, and watching Spanish videotapes. The history and culture of Hispanic people will also be studied. Students continue to attend the Language Lab.

OLDER INTERMEDIATES SPANISH

The textbook Persona a Persona is used with students at this level. Students begin by reviewing and building on previously learned oral and written skills and move toward more advanced Spanish conversation, grammar, reading and writing. Additionally, students learn Hispanic history, culture, and geography. Intermediate III students also use the Foreign Language Lab.

OLDER INTERMEDIATES FRENCH

Intermediate II and III students will have a 6 week French culture and language study. The students will study a map of France, learn about its capital, main products, and its flag. The students will also learn the numbers from 1 to 20, the colors, days of the week, months, time, greetings and polite expressions. The students will also learn a French song.

UNIVERSITY SCHOOL

SPECIAL SUBJECTS: General Music

Teacher:

Cathy Freeman
University of Houston, B.A. Music Education
Kodaly and Orff training, Spring Branch - ISD Texas
Kodaly and Orff workshop, Houston Texas
Choristers Guild Seminars, Dallas, Texas, and Carthage College, Kenosha, Wisconsin

GENERAL MUSIC

General Music is a course intended to provide a variety of sequentially arranged activities through which students may acquire concepts of rhythm, melody, harmony and texture, form and timbre. The Kodaly and Orff methods of music education are used at University School with both intermediate and primary children. The Kodaly method is used to teach students to read music notation using solfege and hand signs. Students study a variety of musical styles but the core of the music curriculum is American folk music.

The Orff approach to elementary music learning addresses every aspect of musical behavior: performing, creating, listening, and analyzing. It combines singing, movement, speech and the playing of Orff instruments to learn improvisation and musical sensitivity. The soprano recorder is also used in the intermediate classes.

Course Goals:

1) Students will demonstrate understanding of musical concepts by performing, reading, writing, analyzing, and creating.
2) Students will study melodic and rhythmic concepts in sequences of difficulty.
3) Students will demonstrate performance skills both individually and as part of an ensemble.
4) Students will build a vocabulary of musical terms and symbols which will increase with each successive year.
5) Students will demonstrate the social skills necessary to work with other students toward achieving musical goals.

Course Texts:

The Kodaly Method by Lois Choksy. Prentice Hall, Inc. Englewood Cliffs, New Jersey
150 American Folk Songs by Peter Erdri. Boosey and Hawks, New York, New York.
Listen, Look, and Sing, Vol. I, II, and III by Aden G. Lewis. Silver Burdett Company, Morristown, New Jersey.
Orff-Schulwerk Music for Children by Carl Orff and Gunild Keetman. Adapted by Margaret Murray. Schott and Company, Ltd. London, England.
Music for Children, Orff-Schulwerk American Edition, Schott Music Corporation.
Supplements to Music for Children, Orff-Schulwerk American Edition, Schott Music Corporation
Discovering Orff by Jane Frazer, Schott Music Corporation

Many other musical materials are also used in general music.

UNIVERSITY SCHOOL

SPECIAL SUBJECTS: Art and Drama

Teachers:

Patricia Hollingsworth
Florida State University, B.S., Education
University of Tulsa, M.T.A., Art Education
University of Tulsa, Ed. D., Ed. Administration
Graduate Work:
George Washington University
University of Florida
University of Oregon
SOI Institute Workshops, Advanced Trainer
Post-Graduate Work with Renzulli,
University of Connecticut

Olivia Marino
University of Tulsa, B.F.A., Art
University of Tulsa, M.A., Painting
Philbrook Museum of Art, Adjunct Lecturer
Museum Education
Tulsa Jr. College, Adjunct Faculty, Humanities

ART

The art curriculum attempts to fulfill the purposes of University School by developing the creative, academic, and social/emotional potential of students.

The goals of the program are:
1) for students to learn to creatively express their ideas and feelings visually
2) for students to learn to respond to a wide variety of artistic periods and styles
3) for students to learn ways art has been expressed over time
4) for students to learn to make reasoned judgments about art based on appropriate criteria

Students are introduced to a variety of local artists and art media.

EARLY CHILDHOOD ART - Debi Foster

Art at this level is taught by the classroom teacher, Debi Foster. Emphasis is placed on developing creative self-expression while learning correct methods of caring for materials and equipment.

PRIMARY I ART - Patricia Hollingsworth

For students in Primary I the main focus is a balance between personal expression and learning to observe. Topics for painting and drawing during the teacher-directed instruction time relate to the topics of study in class and are teacher selected. The way in which the child interprets topics and observations is personal. During independent work time both materials and topics are student choices. Topics include insects, reptiles, amphibians, birds, mammals, and plants. Students observe and draw from living objects as often as possible with personal interpretation continually being valued and encouraged.

PRIMARY II, PRIMARY III, AND INTERMEDIATE I ART - Patricia Hollingsworth

Students continue to draw and paint from observing living objects and interpreting them in their own way. In addition to plant and animal life for topics, students begin drawing man-made objects from life, such as buildings and machinery. The drawing of the human body is continued and developed. Students are introduced to artists that relate to the topics being studied and are introduced to art history through the Human Time Line. Smart Art, introduces students to art theories and art criticism, and Kinetic Kaleidoscope introduces the concepts of movement and energy in art.

OLDER INTERMEDIATES ART - Olivia Marino

Because of their more advanced developmental level, Intermediate students begin working on more long-term projects, such as painting and printmaking. Additional emphasis is placed on drawing from observation with personal interpretation. Students are introduced to design problems that emphasize proximity and overlapping.

Texts: Smart Art by Dr. Pat Hollingsworth and Stephen Hollingsworth. Zephyr Press, Tucson, Az.
Kinetic Kaleidoscope by Gail Herman and Pat Hollingsworth, Zephyr Press, Tucson, Az.

OLDER INTERMEDIATES DRAMA - Olivia Marino

Students will practice improvisational skills, and skills related to acting. The class will concentrate on the process of collaborative script-writing, from individual work on monologues and duologues. Scripts will be cooperative efforts, especially in their revision, which will result from in-class corrections. Re-writes after classroom rehearsal may be expected to incorporate dialogue. First semester efforts will culminate in the Winter Drama Festival. The second semester's emphasis will consolidate individual work in characterization. Subjects to be dramatized will correlate with subject-matter in history and geography when possible

Text: Theatre Games for Young Performers, Maria C. Novelly

UNIVERSITY SCHOOL

SPECIAL SUBJECTS: Kumon Math

Older Intermediate Teacher:
Cyndie Kidwell
Tulsa Jr. College coursework
Kumon Training

Kumon Math is an individualized, self-learning approach to math that emphasizes repetition, speed, and accuracy. Developed 35 years ago in Japan by Toru Kumon to help his son, Kumon helps students internalize basic math skills, such as multiplication tables and division of fractions. We use Kumon daily with all students Primary II level and older.

Each Student is given a diagnostic test to determine his or her level of mastery. Mastery meaning the ability to complete worksheets accurately within a specified time frame. If there are mistakes, students correct them. Worksheets are completed when the student scores 100%. Kumon is extremely sequential, thorough, and systematic. Students master a concept before they move on to another concept.

We emphasize the similarity between Kumon and exercise. For example, a runner might complete a track in 5 minutes. At which time the coach responds, "Good work, now try for 4 minutes." Kumon is like exercise in that if you do it you will like it and get better. If you do not, you will not.

For years, our students have had a good grasp of math concepts. What so many did not have was an internalized mastery of basic computational skills. This is what Kumon does for students.

Older Intermediates have Kumon four times a week if they are not on grade level. Those who are on grade level have a class of their choice once a week. Some of the options are free reading, being a classroom assistant, drama class, art class, computer use, office helper, science assistant, and library reader.

SPECIAL SUBJECTS: Developing Multiple Talents

DEVELOPING THE TALENTS

The development of multiple talents is a high priority at University School. The model used throughout the school is Talents Unlimited, based on Calvin Taylor's research and developed by Carol Schlichter. The talents of 1) Productive Thinking, 2) Planning, 3) Communication, 4) Decision Making, and 5) Forecasting, are taught within the context of the academics. For example, to teach productive thinking in math, students might be asked to think of the many, varied, and unusual ways that fractions can be used. To teach planning in social studies, students might be asked to plan the cargo that Columbus should have carried with him. Each one of the Talents has specific steps to be learned and is always taught within academic content. All classroom teachers are involved in teaching the Talents.

UNIVERSITY SCHOOL

SPECIAL SUBJECTS: INTERMEDIATE Science

Teacher:

Sharon Block
University of South Dakota, A.A., R.N.
Morningside College, B.S. , Psychology
Former Education Outreach Lecturer for the Margaret Hudson Program
Selected for graduate work, National Science Foundation grant, Tulsa, 1990

The theme for all Intermediate students in science, "Investigating Our Environment," is part of the modified spiral curriculum plan for University School science. Studies have shown that any topic of science can be taught at any grade level. However it is not possible to teach every science topic every year. The modified spiral plan provides for topics to be introduced and later reintroduced to help insure the development of concepts, knowledge, skills, and maintenance of those.

The purpose of the science curriculum is to stimulate observation and curiosity while developing scientific inquiry skills. The course provides a balance between fact-acquisition and problem solving. Experimentation and hands-on learning are stressed. During all units the importance of accurate data record keeping is emphasized.

Goals for Intermediate science students are: 1. to like science, 2. to enjoy learning, 3. to see their place in the environment, and 4. to develop a knowledge base in science.

INTERMEDIATE I SCIENCE

Intermediate I students study changes on Earth, geology on Earth, and the Solar System. Students also study plants and animals, including humans; review states of matter; and learn about physical and chemical changes.

As in all science classes, hands-on activities, experiences, and experiments are essential ingredients. Students build upon and extend their skills in predicting, observing and recording.

OLDER INTERMEDIATES SCIENCE

Students are actively involved in experiments and experiences. They are encouraged to move beyond the basic experiments into productive thinking, forecasting, and problem solving. The spiral curriculum of our science classes allows students to each year build upon and extend their previous skills and knowledge. Topics on pages 27 and 28 are some of the subjects covered. Periodic trips to the University chemistry lab are taught by Dr. Robert Howard, Chair of the Chemistry Department. Current events in science are part of the curriculum.

UNIVERSITY SCHOOL

SPECIAL SUBJECTS: Library/Resource Room

Librarian:

Robyn Bowman
Oklahoma State University, B.S. Library Science
University of Texas, M.S. Library Science

Library/Resource Room

The University School library is available for all our students to use. The goals of the library curriculum are:

1. to help students become successful independent learners
2. for students to learn to find a variety of information sources
3. for students to develop abilities to sort and use information in the following formats:
   - Print materials (books, magazines, newspapers, pamphlets, etc.)
   - Non-print materials (pictures, filmstrips, films, video-cassettes, human resources, etc.)
4. for students to develop skills to classify and arrange information after it has been located and interpreted
5. for students to learn to communicate information in various formats
6. for students to learn to enjoy a wide variety of literature

Students come to the library to have stories read a-loud to them, to check out books, and to learn library and research skills. The library is computer connected by LIAS to The University of Tulsa library and to the Tulsa City-County Library system.

UNIVERSITY SCHOOL
SCOPE AND SEQUENCE:
Language Arts, Math, Etc.

LANGUAGE ARTS	Early Child	Primary I	Primary II	Primary III	Intermed I	Older Intermed
D'Nealian Handwriting Manuscript		X	X	X	X	X
D'Nealian Handwriting Cursive					X	X
Organic Reading and Writing						
Words	X	X				
Sentences		X	X			
Paragraphs		X	X	X	X	X
Dictionaries			X	X	X	X
Writer's Conference				X	X	X
Literature	X	X	X	X	X	X
Creative Writing	X	X	X	X	X	X
Shurley English Grammar				X	X	X

MATH	Early Child	Primary I	Primary II	Primary III	Intermed I	Older Intermed
Math Their Way	X	X	X	X	X	X
Kumon Math			X	X	X	X
Mathematics a Way of Thinking				X	X	X
Addison-Wesley Mathematics				X	X	X

TALENTS	Early Child	Primary I	Primary II	Primary III	Intermed I	Older Intermed
Productive Thinking	X	X	X	X	X	X
Forecasting	X	X	X	X	X	X
Planning		X	X	X	X	X
Communication		X	X	X	X	X
Decision Making			X	X	X	X

ENRICHMENT TRIAD	Early Child	Primary I	Primary II	Primary III	Intermed I	Older Intermed
Type I Exploration Activities	X	X	X	X	X	X
Type II Training Activities	X	X	X	X	X	X
Type II.5 Beginning Independent Studies			X	X	X	X
Type III Investigations of Real Problems for Real Audiences					X	X

	Early Child	Primary I	Primary II	Primary III	Intermed I	Older Intermed
MUSIC	X	X	X	X	X	X
COMPUTER	X	X	X	X	X	X
SPANISH	X	X	X	X	X	X
ART	X	X	X	X	X	X
LIBRARY	X	X	X	X	X	X

PHYSICAL EDUCATION	Early Child	Primary I	Primary II	Primary III	Intermed I	Older Intermed
Informal Activities	X	X	X	X	X	X
Formal Instruction				X	X	X

UNIVERSITY SCHOOL
SCOPE AND SEQUENCE:
Social Studies and Science

	SOCIAL STUDIES FOCUS: INTERDEPENDENCE	SCIENCE FOCUS: INVESTIGATION
Early Childhood	Investigating Our World -Combined Social studies and Science -Responsibility and Cooperation -Using the Talents -Oviparous Animals -Fish	
PRI I	Ourselves and Others -History of Holidays -Life in Other Countries	-Animals: Insects, Reptiles, Birds, Fish, Amphibians, Mammals, Undersea creatures -Water: Floating, Rust, Evaporation -Plants: Flowers, Roots, Stems
PRI II	Living Together at Home and School -Rules and Manners -Problem Solving -Cooperation -Review of Holiday History	Investigating Changes Around Us -Magnetism & Electricity -Behavior of Matter: Solids, Liquids, and Gases -Animal Hibernation -Soil and Plant Growth
PRI III	Interdependence of Communities and Regions in the U.S. -Economic and Consumer Education -Form of government -Major U.S. Historical events	Investigating Life Cycles -Studies and experiments with plants Investigating Our Environment -Matter: Solids, liquids, gases -Magnetism -Use of the Compass

	SOCIAL STUDIES FOCUS: INTERDEPENDENCE	SCIENCE FOCUS: INVESTIGATION
INT I	Interdependence of Communities and Regions of the World -Land forms influence on climate, economics and culture -Global perspective of Interdependence -Study of states and Presidents of U.S. -Major World History Events	Investigating Our Environment -Solar System -Geology -Matter: States of matter, chemical changes, physical changes -Machines -Health -Plants -Environment: Ecology and communities -Compass
Older Intermed.	America and the World Community -History, geography, government -Reading of biographies, historical fiction and non-fiction -Land forms, climate, land use products -Maps and Globes	Investigating Our Environment -Weather -Magnetism -Ecology -Air -Water -Pollution -Electricity -Plant and Animal Growth and Response -Flight (aerodynamics) -Properties of Matter -Weights and Measures -Sound -Light -Compass -Machines -Chemistry, including acid/base and pH

Programs: Enhancing Think Skills

Enaction Theory, Simulations, and the Gifted

Patricia L. Hollingsworth

The Enaction Curriculum is the framework used to develop curriculum for a total school program for gifted children ages 3 to 10 at the University of Tulsa in Tulsa, Oklahoma. The Enaction Curriculum is based on Enaction Theory of Thinking (Ohlsson, 1983) with a focus on domain specific knowledge.

***Patricia L. Hollingsworth** is the Coordinator of the University of Tulsa Gifted Program.*

Enaction Theory

Enaction theory postulates that thinking is a matter of running a simulation of the world in one's head. According to Ohlsson, the three categories involved in thinking are: (a) representational knowledge, which is creating a mental model of an idea or concept; (b) procedural knowledge, which is mentally computing the outcome of manipulating the model; and (c) heuristic knowledge, which is deciding which actions and processes are best in a particular situation. It could be said that thinking proceeds by applying mental manipulations to mental models under the guidance of heuristics.

The Representation Mental Model

The first category in the theory is that of developing a representational mental model of the concept. A mental model will be structurally like the object system that it represents, but it should not be equated with a visual image. Our internal mental models will be more like drawings, diagrams, or musical scores than they will be like a written textbook. For example in Figure 1, a person is encoding a model of a nice little yellow flower.

Operators of the Mental Model

In the visual example, the encoded model of the little yellow flower begins to change as the thinker has more experience with dandelions. For every object system there are actions which can be performed on it. These actions will be mirrored internally by a mental procedure called an operator. The mental model is run through a mental procedure that causes the model to change. The operator represents the ability to anticipate an outcome of an event. The thinker can run a model through a series of operators as is done in Figure 1. The thinker begins to run the yellow flower through a number of operator options. "If I use weed killer, it may cause environmental damage. If I mow, they will just come back. If I get professional lawn care, it will be very expensive. If I try to pull them up, it will be very hard work and very time consuming. I could start a dandelion farm, but I might be run out of the neighborhood."

Heuristics: A Rule for Using the Model

Our thinker finally develops a rule for dealing with these little yellow flowers. "When there are many dandelions that I do not want, I will use weed killer once, pull up a few, and mow the remainder." The heuristic, or rule, connects situations with goals and appropriate actions. An established set of rules becomes particularly important in playing chess or solving math problems. In these situations the thinker needs a way to select which operator to apply next from an array of options. Finally, a collection of heuristics will constitute a strategy. However, knowing the rules that one uses can be equally important in creative endeavors. An artist or writer might say, "I used this heuristic in my last work. This time I want to try a new heuristic."

Thematic Content

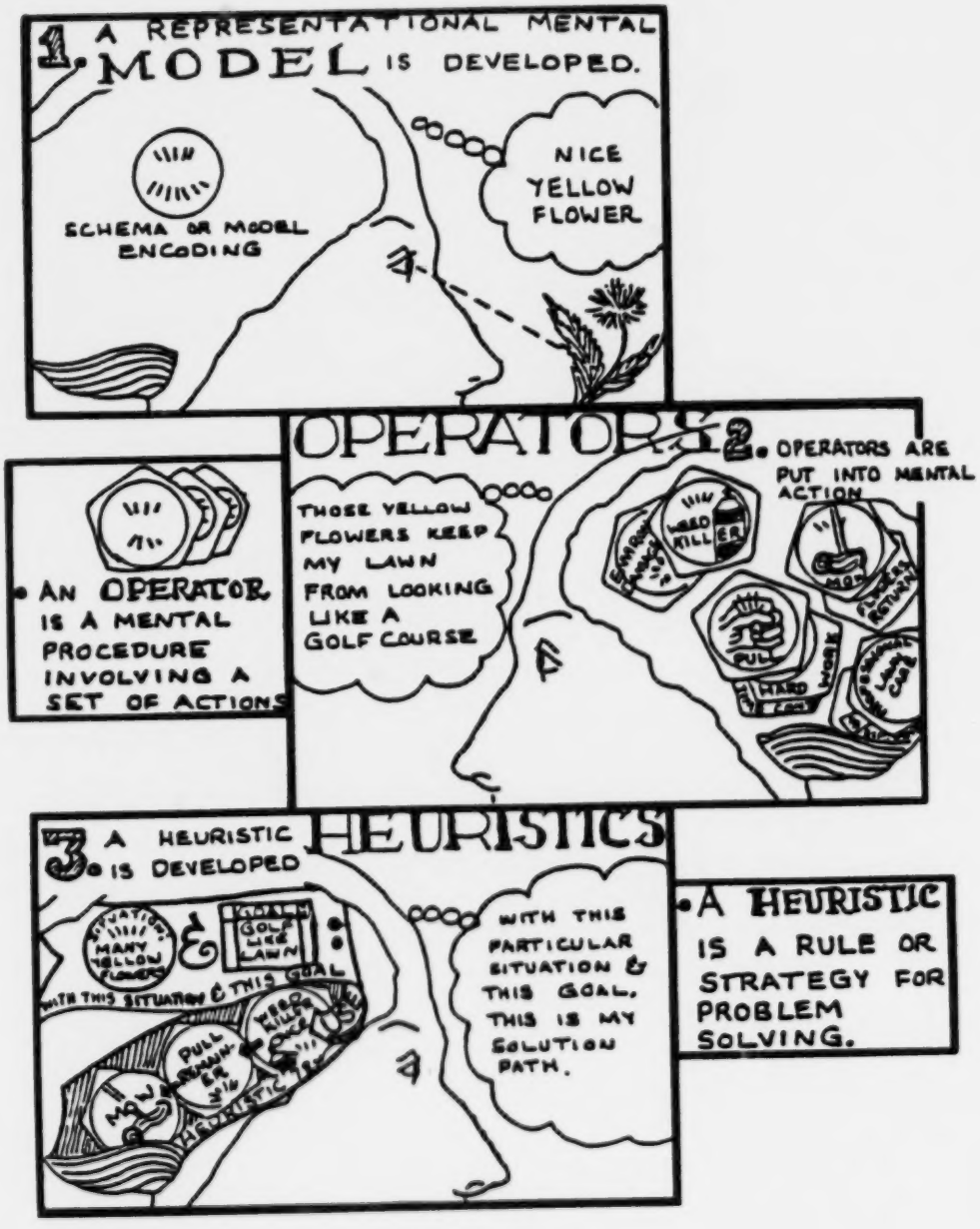
Coupled with the process-oriented Enaction Theory is an emphasis on thematic content. A great deal of research (Glaser, 1984) has found that thinking is strongly influenced by experience with new information. High-knowledge subjects show better memory and encoding performance than low-knowledge subjects. Expert problem solvers are those with conceptual and procedural knowledge in a specific content area. The research shows that a major component of thinking is accessible and usable knowledge. Because thinking and something to think about are essential ingredients in a gifted program, the Enaction Curriculum links the process of thinking with thematic content.

Some of the themes are selected by a group of teachers and used by the whole school for approximately a month. Other themes are selected by individual teachers and used for varying periods of time.

The Enaction Curriculum

One direction that the Enaction Curriculum has taken is the wide use of simulations. A simulation is a reenactment of a concept, idea, or event. By dramatizing a real or imaginary occurance, a person can safely experience worlds that would otherwise

Figure 1.
Taxonomy of Thinking Based on Enaction Theory


1. A REPRESENTATIONAL MENTAL MODEL IS DEVELOPED.
SCHEMA OR MODEL ENCODING
NICE YELLOW FLOWER
• AN OPERATOR IS A MENTAL PROCEDURE INVOLVING A SET OF ACTIONS
OPERATORS
2. OPERATORS ARE PUT INTO MENTAL ACTION
THOSE YELLOW FLOWERS KEEP MY LAWN FROM LOOKING LIKE A GOLF COURSE
3. A HEURISTIC IS DEVELOPED
HEURISTICS
WITH THIS PARTICULAR SITUATION & THIS GOAL, THIS IS MY SOLUTION PATH.
• A HEURISTIC IS A RULE OR STRATEGY FOR PROBLEM SOLVING.

be unavailable. Simulations are a way to present complex historical, literary, and cultural content to young gifted children. The simulations, called CLUES (Creative Learning and Understanding by Educational Simulations), range in content from archaeology (Tulsalite Magazine, 1983) to zoology. CLUES provide opportunities for students to become physically and mentally involved in creating a model of an object system. Once the model is created, it can be acted upon and changed. Various operators can be applied to the model and the beginning of a set of heuristics can be made.

Developing a Mental Model

The first step in CLUES is to develop a representational model. In a unit study on mythology, the five- and six-year-olds were read, on different days, several versions of the story of Ulysses and the Trojan Horse. When movies or filmstrips are available on a topic, those are shown. After the stories, the children discussed and drew pictures of their favorite parts of the story. Later the children selected who or what they would like to represent in the story. This time as the story was read, the children dramatized it. One child pretended to be Paris stealing Helen, another pretended to be Ulysses gathering an army, others pretended to be the Trojan horse. At this point, children could make small boats to sail to Troy, make a 3-D model of a Trojan horse, or give a presentation to parents or another class. The presentation is not an attempt at a polished production. The purpose is to develop a mental model of the story.

Applying Operators

Operators are mental changes made upon the model. The second step in CLUES is to apply various operators. Once students have developed a mental model of Ulysses, for example, one can anticipate actions in various hypothetical situations. In one simulation, students were divided into three groups: The Greeks with Ulysses as leader, the Trojans with Aeneas as their leader, and the prophet Laocoon and his followers. In this simulation, Laocoon convinced the Trojans to distrust the Greeks bearing a gift of a huge wooden horse. The Trojans had to decide what to do about the horse and Ulysses had to make another plan. Other operators would be for students to devise a plan in which the Trojans win the war or develop a plan for peace. Thus various operators applied to a model give opportunities to try a number of solutions to a problem.

Developing a Rule

A rule that connects situations, actions, and goals is a heuristic. A group of heuristics is a problem-solving strategy. The simulation provides a safe forum for trying operators, heuristics, and strategies. In a simulation, a miscalculated solution path is not as serious as in the real world. The simulation gives the participant a chance to select a procedure and gain feedback from other participants. The simulation is both an experience and an experiment.

After a simulation, the group comes together to discuss the heuristics that were used in the simulation. The group evaluates the effectiveness of the heuristics. The situation, goal, and rule that proved helpful are identified. In one version of the simulation, when Ulysses' wooden horse ploy failed (the situation), he called a council meeting with the Trojans (the strategy) to negotiate the return of Helen (the goal). In this simulation, the strategy worked, so the group wrote a heuristic for this situation. *Heuristic from the Ulysses Simulation:* If you want something from people, try talking to them.

Another heuristic was developed in this way. The teacher wrote part of one heuristic that developed from the Ulysses simulation. The teacher read her portion of the heuristic, "The Greeks were becoming discouraged. Their leader, Ulysses, came up with an unusual plan. What can we learn from this story? What rule or heuristic can we develop? I will give you a beginning to the heuristic. You will give me the ending. If you have a problem that must be solved _____." Some of the answers were: "don't give up," "try something different," and "use your brain."

A simulation can become a product that is performed only for the participants or for a larger audience. Some of our simulations have been video taped. Older children can develop simulations as a form of Type III activities (Renzulli, 1977).

Simulations are an important part of the Enaction Curriculum, because they provide a way to couple the process orientation of Enaction Theory with thematic content. Children can begin to see simulations as a model of the thinking process. Simulations provide a method for developing a mental and physical representational model, manipulating that model, and developing strategies for thinking and problem solving. The teaching of these thinking skills through the use of thematic content may put us closer to Ward's (1980, p. 126) proposition "that in the education of the gifted individual there should be considerable emphasis upon intellectual activity."

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